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himself from taking any notice of the religious opinions of Zwinglius. This seems to indicate, that a free discussion of religious topics is tender ground in France.

DISCOVERIES AND IMPROVEMENTS IN ARTS, MANUFACTURES, &c.

Collinge's new patent Axle-trees and Boxes. The following are the peculiar properties of this Invention, viz :—

SIMPLICITY in the mechanical construction; the most perfect security against a wheel coming off; and extreme durability, from their hard, accurate, and highly-polished surfaces being constantly supplied with oil.

By these means it may be presumed that friction is nearly annihilated; and those who have them in use assert their belief, that the draught is diminished one-fourth.

When it is considered that common axle-trees are, in fact, conical wedges, instead of being cylinders, the friction must be always great, sometimes immense; and the enormous expense in greasing and repairing them is a confirmation of the fact.

As every axle-tree and box is made to distinct and standard dimensions for each denomination of carriages, the wheels of one may be applied to those of another, in any part of the kingdom.

Any wheelwright can box wheels on this construction; and a common labourer put them on, or take them off, in a few minutes.

The Sudbury Coach, which sets out from Mr. Glover's, the Green Dragon Inn, Bishop-gate-street, travelled ten thousand miles with once oiling only; from which performance alone an expense was saved of nearly one-half the price of these axle-trees, independent of the relief to the horses.

The adoption of this invention to rail-road waggons, in particular, would produce an immense saving, as once oiling would serve them for half a year at least.

As the establishment for manufacturing these axle-trees has been made upon a very large and expensive scale, and the profits required very moderate, they must be paid for on delivery.

The great utility of the inventor's former patent axle-trees, for gentlemen's carriages, may be estimated by the fact of there being upwards of six thousand now in use, comprising those of his Royal Highness the Prince Regent; the Princess, and Princess Charlotte of Wales; the Dukes of York, Clarence Kent, and Cumberland; and the principal nobility and gentry in the united kingdom.

Made and sold only at the Manufactory, Bridge-road, Lambeth, where axle-trees of every description are made, of the best materials, and superior workmanship, at the usual prices.

Specification of the Patent granted to James Hall, of Walthamstow, in the County of Essex, Clerk; for a method or process of manufacturing a material of Twigs or Branches of Broom, Mallows, Rushes, and *other Shrubs or Plants of the like species, to be used in the stead of Flax or Hemp, and for the same purposes for which Flax and Hemp are now used. Dated July 3, 1810.*

To all to whom these presents shall come, &c. Now know ye, that in compliance with the said proviso, I the said James Hall do hereby describe and ascertain the nature of my said invention, and the manner in which the same is to be performed, as follows; that is to say: The twigs or shoots of broom, of the former years growth, and the most vigorous, are always the best, are useful only for the flax of broom, they being surrounded by a double covering, the outer resembling scales, or the husks of wheat, rye, and the like, and the inner a substance of the nature of flax. The shoots or twigs of broom that are more than a year old have also two coverings, but the scales are much thicker, and the flax is so intermixed with gum, oil, and other materials of the kind, that a bark is formed in which the flax is so embodied that it refuses to be separated. The shoots or twigs may be collected or not immediately when cut; and if they lie a month or two about the bushes from whence they have been cut, they will scarcely receive any injury. With regard to their roots and branches, they should as much as possible be laid all one way, and be tied up in parcels with bands of broom, in the same way as is done with wheat, flax, hemp, &c. On being steeped three or four weeks, according to the heat of the season, in stagnant water, or boiled an hour or two in water, the flax comes easily from the shoots or twigs, and, where there is not machinery for the purpose, may be peeled or stripped off by children, or others, at any time when not quite dry, in the same way as hemp is peeled from the stalks. The shoots or twigs may be cut down any time from the latter end of September, when the growth ceases, till April or May, that a new set of shoots are forming; but unless the process is carried on by boiling the broom, the best season for steeping the twigs or shoots, as also for preparing the flax for the manufacturer, is during warm weather, as the hands are often wet during the process, which is unpleasant, and by no means wholesome, either for old or young during cold weather. If water cannot be conveniently had for steeping them, the twigs or shoots, as already noticed, do not lose any of their value, though kept for years, if kept dry. These, on being spread out to the dew or rain, or any wet, and then heaped together, soon begin to ferment or heat; and after this heating or fermentation commences, which must not be permitted to proceed too far, for fear of rotting it, the flax comes easily from the twigs or shoots, in the same way as if it had been steeped in water. If the twigs or shoots are suffered to ferment or heat too much, the flax being thereby damaged, breaks in stripping off; but if they are not fermented enough, the flax adheres, and does not come easily from the twigs. The same is the case when they are steeped or boiled in water; if too little done, the flax does not come off easily, but breaks; if too much, it does the same; but the breaking arises from the flax being hurt by over-much boiling or steeping; those, therefore, who are employed in this business have only to take a twig or stalk out now and then, and see when the whole is ready, by trying a few individual shoots. Where broom has been steeped, the water becomes partly fœtid, or stinking, and of a darkish colour, and it acquires such a taste as makes cattle dislike to drink it; but neither the taste nor the smell is so disagreeable as that produced by flax or hemp. Broom swims when first put into the water, but soon begins to sink, and to have a peculiar, though not an unwholesome smell: this smell gradually disappears both from the flax and the twigs denuded of the flax as they become more dry. When the flax is stripped from the twigs or shoots it appears dark, gummy, and seemingly of no use; but on being washed well in cold water, then rubbed and shaken, which may be done by machinery or hand-labour, the flax begins to appear, becoming more and more strong, and pleasing to the eye, as it dries, and is cleared of the scales or chaff by being rubbed and shaken. If the broom-flax is to be hackled, which in general should be left to the manufacturer, the hackle, particularly the first one, should be like a comb, having only one row of teeth, as from its nature and the fibres of which it consists not proceeding in straight lines but from a variety of smaller, branching out from the main stem or shoot, broom-flax does not bear the hackle well, either wet or dry. On being simply washed, rubbed or shaken well, broom-flax becomes an object of much importance to a variety of people, as well as to the paper manufacturer, the manufacturer of patent floor-cloth, also the manufacturer of rugs, carpets, and other useful purposes. The shoots or twigs of broom, on being cleared of the flax, boiled a given time, or steeped in boiling water, become tough, and beautifully white, and admirably calculated for being converted, under the name of Genesta-wood, the generic term for broom of all kinds, into carpet brooms, brushes for furniture, cloths, green cloths, and rincers for cooks, charwomen, and the like, at the same time into various useful purposes, where things are dusty in the dressing room, coach-house, &c. as well as for certain parts of all kinds of wicker-work. In procuring the flax of rushes, which so far as is yet discovered, is not an easy matter, the rushes are to be exposed for months in water; on other occasions they are either to be buried in a stable dunghill, and heaped together to heat or ferment, or to be plunged into some cheap chemical menstruum or liquid, so as to separate the flax, of which all kinds of them contain a considerable quantity, from the green outer coat, to which it adheres very tenaciously.

When a material for certain kinds of paper is the object in view, the rushes are to be beat to a pulp by a mill, or otherwise, in water, either hot or cold, as convenient, and then sent through a search, or searches, as occasion may require, for the sake of the fibres and flaxen materials that do not pass through the searches.

In procuring the flax or fibres of mallows, particularly the *Malva Silvestris*, which grows in abundance in many parts of Britain and Ireland, and even in the immediate vicinity of London, without being thought worth cutting down, the mallows and plants of that nature are to be steeped three or four weeks in water, or more if necessary, or to be put into a heap to ferment, and then to be denuded of the flax or fibres by stripping or peeling them off, which is an extremely easy matter, as these are beautifully white, resembling camel's hair in many particulars. After being stripped off, they require only to be washed, either in cold or warm water, shaken and hackled a little, which may be done either wet or dry, previous to their being sent off to the manufacturer of shawls, fancy vests, and fabricks of that nature, for which they seem admirably calculated.